Name: Date:

Polynomial Factoring solution (version 29)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 112}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-108}}{2}$$

$$x = \frac{2 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{2 \pm 6\sqrt{3}\, i}{2}$$

$$x = 1 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 - 8i$ and $-2 + 4i$ in standard form $(a + bi)$.**

Solution

$$(-3 - 8i) \cdot (-2 + 4i)$$

$$6 - 12i + 16i - 32i^2$$

$$6 - 12i + 16i + 32$$

$$6 + 32 - 12i + 16i$$

$$38 + 4i$$

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3. **Write function $f(x) = x^3 + 5x^2 - 18x - 72$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	5	-18	-72
4		4	36	72
	1	9	18	0

$$f(x) = (x-4)(x^2+9x+18)$$

$$f(x) = (x-4)(x+6)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+6)\cdot(x+2)^2\cdot(x-1)$$

Sketch a graph of polynomial $y = p(x)$.